



## ENGINEERING DATA SHEET (HCl, Co-flow regeneration)

These data provide information to calculate the sodium leakage and operating capacity of AMBERJET 1200 Na used for water demineralisation with co-flow regeneration with hydrochloric acid. The properties of AMBERJET 1200 Na are described in the Product Data Sheet PDS 0354 A.

These data are valid for Amberjet 1200 H but the results obtained refer to the Na form and must be corrected for the reversible swelling between the Na and H forms.

### SODIUM LEAKAGE

The average sodium leakage is obtained by multiplying the basic leakage value from Table 1 by the correction factor A from Table 2.

$$\text{Leak} = \text{Leak}_0 \times A$$

Table 1 : Basic Sodium Leakage versus HCl Regenerant Level

HCl g/L	Leakage % EMA (Leak <sub>0</sub> )
50	3.9
60	3.0
70	2.5
80	2.0
100	1.5
120	1.2
150	0.9

Note : Sodium leakage values are expressed as a percentage of the equivalent mineral acidity (EMA).

The value obtained in meq/L must be converted to mg/L as Na and eventually to a conductivity value, using the graph supplied in the Memento of Ion Exchange published by Rohm and Haas.

Table 2 : Leakage Correction Factor A versus Sodium to Total Cations Ratio

Na %	Factor A
10	0.15
20	0.30
30	0.50
40	0.75
50	1.00
60	1.30
70	1.70
80	2.20
90	2.80
100	3.60

Table 3 : Suggested Operating Conditions

Maximum operating temperature _____	120°C
Minimum bed depth _____	800 mm
Service flow rate _____	5 to 50 BV*/h
Maximum linear velocity _____	60 m/h
Regenerant _____	HCl
Level _____	50 to 150 g/L
Minimum contact time _____	20 minutes
Concentration _____	4 to 10 %
Slow rinse _____	2 BV at regeneration flow rate
Fast rinse _____	1 to 3 BV at service flow rate

\* 1 BV (Bed volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin

## OPERATING CAPACITY

The operating capacity of AMBERJET 1200 Na with hydrochloric acid is obtained by multiplying the basic capacity value from table 4 by the correction factors B to E from tables 5 to 8.

$$\text{Cap} = \text{Cap}_0 \times B \times C \times D \times E$$

Table 4 : Basic Capacity versus HCl Regenerant Level (co-flow regen.)

HCl g/L	Capacity eq/L (Cap <sub>0</sub> )
50	0.93
60	1.02
70	1.10
80	1.17
90	1.23
100	1.28
120	1.37
150	1.47

Table 7 : Capacity Correction Factor D versus Water Temperature

Temperature °C	0	50	99 % Na
5	0.97	0.95	0.92
10	0.99	0.98	0.97
15	1.00	1.00	1.00
20	1.01	1.01	1.02
25	1.01	1.03	1.04
> 30	1.02	1.04	1.06

Table 5 : Capacity Correction Factor B versus Sodium to Total Cations Ratio

Na %	Factor B
0	1.00
10	0.98
20	0.97
30	0.97
40	0.98
50	1.00
60	1.02
70	1.05
80	1.09
90	1.13
100	1.16

Table 6 : Capacity Correction Factor C versus Alkalinity to Total Anions Ratio

% Alk	Factor C
0	0.95
30	0.98
50	1.00
70	1.02
99	1.05

Table 8 : Capacity Correction Factor E versus Run Length (Production Time)

Run Time (hours)	0	50	99 % Alk
5	0.96	0.98	1.00
8	0.98	1.00	1.01
10	0.99	1.00	1.01
20	1.01	1.01	1.01
> 25	1.01	1.01	1.02

Rohm and Haas/Ion Exchange Resins - Philadelphia, PA - Tel. (800) RH AMBER - Fax: (215) 537-4157  
 Rohm and Haas/Ion Exchange Resins - 75579 Paris Cedex 12 - Tel. (33) 1 40 02 50 00 - Fax : 1 43 45 28 19  
 WEB SITE: <http://www.rohmhaas.com/ionexchange>



AMBERJET is a trademark of Rohm and Haas Company, Philadelphia, U.S.A.

Ion exchange resins and polymeric adsorbents, as produced, contain by-products resulting from the manufacturing process. The user must determine the extent to which organic by-products must be removed for any particular use and establish techniques to assure that the appropriate level of purity is achieved for that use. The user must ensure compliance with all prudent safety standards and regulatory requirements governing the application. Except where specifically otherwise stated, Rohm and Haas Company does not recommend its ion exchange resins or polymeric adsorbents, as supplied, as being suitable or appropriately pure for any particular use. Consult your Rohm and Haas technical representative for further information. Acidic and basic regenerant solutions are corrosive and should be handled in a manner that will prevent eye and skin contact. Nitric acid and other strong oxidising agents can cause explosive type reactions when mixed with Ion Exchange resins. Proper design of process equipment to prevent rapid buildup of pressure is necessary if use of an oxidising agent such as nitric acid is contemplated. Before using strong oxidising agents in contact with Ion Exchange Resins, consult sources knowledgeable in the handling of these materials.

Rohm and Haas Company makes no warranties either expressed or implied as to the accuracy of appropriateness of this data and expressly excludes any liability upon Rohm and Haas arising out of its use. We recommend that the prospective users determine for themselves the suitability of Rohm and Haas materials and suggestions for any use prior to their adoption. Suggestions for uses of our products of the inclusion of descriptive material from patents and the citation of specific patents in this publication should not be understood as recommending the use of our products in violation of any patent or as permission or license to use any patents of the Rohm and Haas Company. Material Safety Data Sheets outlining the hazards and handling methods for our products are available on request.